Claims

1. Method for the measuring of the density of blood cells in blood **characterized in** the directing of a light beam into the space that is to be investigated and that one or several sensors are so arranged that its or their sense sectors do not intersect the beam of the light source in the volume.

2. Method according to claim 1, **characterized in** that two sensors are used that are opposed to each other.

3. Method according to claim 1 or 2, **characterized in** that light beam and sensor sector(s) are perpendicular to each other.

4. Sensor device for the measuring of the density of blood cells in blood **characterized in** comprising vessel or tubing, a light beam emitter facing the tubing, and one or several sensor(s) also facing the vessel and so arranged that its or their sense sectors do not intersect the beam of the light source in the vessel or tubing.

5. Sensor device according to claim 4, **characterized in** that the locations of the light source and sensor(s) respectively are separated lengthwise of the vessel or tubing.

6. Sensor device according to claim 4 or 5, **characterized in** that two sensors are arranged with their sensing directions perpendicular to the light beam.

7. An optical probe arrangement that surrounds blood in a receptacle, said optical probe arrangement comprising at least two sets of light emitters and light detectors, each set comprising one light emitter and at least one detector, each set arranged to transilluminate the blood at a preferred angle between said light emitter and said light detector – or detectors – of each set, where said angle is at least sufficient to avert direct light from said light emitter to said light detector, for the detection of blood constituents.

8. An optical probe arrangement according to claim 7, comprising four sets of light emitters and two or three light detectors in each set, wherein a light detector may represent a detector incorporated in an adjacent set.

9. An optical probe arrangement according to claim 7 or 8, wherein the light emitters are arranged as an array to encircle an elongated receptacle at longitudinally one location around said receptacle's circumference, and the light detector are arranged to encircle the receptacle at a different circumferential location.

10. An optical probe arrangement according to any of the claims 7-9, wherein a

second array of light detectors are longitudinally located at a third location around said receptacle's circumference, and the light detector are arranged to encircle the receptacle at that circumferential location.

11. A method to process signals from light detectors in accordance with any of the claims 4-10, comprising means to amplify signals from the light detectors and the employment of a signal processing algorithm on the signals from said light detectors, to detect blood constituents.

12. A method to process signals from light detectors in claim 8, comprising means to amplify signals from the light detectors and employ a signal processing algorithm on the signals from said light detectors, to detect hematocrit.

13. A method according to claim 12, the signal processing means comprising a multi variable analysis of signals from all light detectors engaged in the signaling process.

14. An optical detector or probe arrangement according to any of the claims 4-10, where a third array of light detectors are longitudinally located at a fourth location around said receptacle's circumference, and the light detector are arranged to encircle the receptacle at that circumferential location and an second array of light emitting diodes longitudinally located at a fifth location around said receptacle's circumference, and the light detectors are arranged to encircle the receptacle at that circumferential location.

15. A method to process signals from light detectors in accordance with claim 14, comprising means to amplify signals from the light detectors and employing a signal processing algorithm on the signals from said light detectors, to detect blood constituents.

16. A method to process signals from light detectors in claim 15, comprising means to amplify signals from the light detectors and employ a signal processing algorithm on the signals from said light detectors, to detect hematocrit.

17. Method to process signals from light detectors in any of the claim 4-10, comprising means to amplify signals from the light detectors and employ a signal processing algorithm on the signals from said light detectors, to detect oxygen saturation in blood.

18. Method according to any of the preceding method claims comprising a signal process, where signals are processed in the time domain.

19. An apparatus according to any of the claims 4-10 claims, comprising a system to calculate hematocrit values from blood, and presenting the data to a display, and/or

transferring data to another application.

20. An apparatus according to any of the claims 4-10, comprising a system to calculate hematocrit values and oxygen saturation values from blood, and presenting the data to a display, and/or transferring data to another application.

21. Method for the measuring of the density of blood cells in blood, **characterized in** the directing of a light beam into the space that is to be investigated and that two sensors, are used that are opposed to each other.

22. Method according to claim 21, **characterized in** that light beam and sensor "beams(s)" are perpendicular to each other.

23. Probe or detector arrangement according to any of the claims 4-10 or 19-20, **characterized in** that the measuring takes place in a tubing that is clamped in a holder with V-shaped recesses so that tube is given a square cross section and that light sources and sensors are arranged at the flat surfaces.
